

A Matched Catalogue of $z > 5.9$ Galaxies in the WFC 3 Hubble Ultra Deep Field

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ABSTRACT

There have been several independent analyses of the recent Wide Field Camera 3 images of the Hubble Deep Field, selecting galaxies at $z > 6$ through the Lyman break technique. Presented here is a matched catalogue of objects in common between the analyses posted to this preprint server, listing the different catalogue names associated with the same sources.

In this brief paper, we collate several different catalogues of Lyman break galaxies in the Wide Field Camera 3 imaging of the Hubble Ultra Deep Field which have appeared since the data become public in September 2009. We also cross-match sources with previously-published catalogues based on the original Hubble Ultra Deep Field images with the Advanced Camera for Surveys in 2004.

Table 1 is the list of 22 galaxies with photometric redshifts between $z = 5.9$ and $z = 6.4$ presented in McLure et al. (2009), with corresponding ID numbers from Bunker et al. (2004) and Yan & Windhorst (2004). Of the 22 galaxies in this redshift range presented in the recent McLure et al. paper, 19 are i' -drops first identified in the Advanced Camera for Surveys imaging of the Hubble Ultra Deep Field in 2004. Two of the remaining three are very faint in the z' -band (with $z'_{AB} = 29.24$ for object 2719 in McLure et al., and $z'_{AB} = 29.37$ for object 2003), and so were not selected in z -band limited samples.

Table 2 presents the McLure et al. sources with $z_{phot} > 6.4$ with corresponding ID numbers from Bunker et al. (2009), Oesch et al. (2009) and Bouwens et al. (2009). There are 16 z' -drops in the Oesch et al. sample, compared with 10 from Bunker et al. In all cases this is due to a slightly different colour selection of $(z' - Y)_{AB} > 1$ in Bunker et al. compared with a bluer cut of $(z' - Y)_{AB} > 0.8$ (which picks up more galaxies at lower redshifts) or the brighter magnitude limit applied in Bunker et al. ($Y_{AB} < 28.5$). The Oesch et al. galaxies UDFz-36777536, UDFz-39586565 (in Table 1) have colours $0.8 < (z' - Y)_{AB} < 1$ and are likely to be at $z \approx 6.4$, and UDFz-37446513 also has colours too blue for the Bunker et al. z' -drop selection. The Oesch et al. galaxies UDFz-37807405 and UDFz-41057156 lie close to

Original ID	McLure ID	RA(J2000)	Dec(J2000)	z_{phot} (McLure)
B 46223	1735	03 32 39.86	−27 46 19.1	5.90
B 16258	1955	03 32 39.46	−27 45 43.4	5.90
B 41918	1719	03 32 44.70	−27 46 45.6	5.95
YW 57	2217	03 32 40.56	−27 48 02.7	5.95
B 27270	962	03 32 35.05	−27 47 40.1	5.95
B 49701	1189	03 32 36.98	−27 45 57.6	6.00
YW 51	2830	03 32 34.58	−27 46 58.0	6.00
YW 91	2498	03 32 35.04	−27 47 25.8	6.00
—	2719	03 32 40.59	−27 45 56.9	6.05
B 45467	1625	03 32 43.03	−27 46 23.8	6.05
B 24733	1398	03 32 36.63	−27 47 50.1	6.10
YW 52	1760	03 32 40.25	−27 46 05.2	6.15
B 44194	934	03 32 37.48	−27 46 32.5	6.20
YW 27	2791	03 32 36.64	−27 47 50.2	6.25
YW 85	1464	03 32 42.19	−27 46 27.9	6.30
—	2003	03 32 36.46	−27 47 32.4	6.30
YW 82	2514	03 32 39.79	−27 46 33.8	6.30
B 44154	837	03 32 37.46	−27 46 32.8	6.35
YW 95	1855	03 32 43.79	−27 46 33.8	6.40
YW 56a	1864	03 32 34.52	−27 47 34.8	6.40
YW 75 (UDFz-36777536)	1911	03 32 36.77	−27 47 53.6	6.40
(UDFz-39586565)	1915	03 32 39.58	−27 46 56.5	6.40

Table 1: The prefix ‘B’ in the column 1 indicates a galaxy first identified as a candidate $z \approx 6$ i' -band dropout by Bunker et al. (2004); the ‘YW’ prefix indicates other (typically fainter) i' -drops identified by Yan & Windhorst (2004). McLure’s objects 1911 & 1915 have also recently been identified by Oesch et al. (2009), with this ID given in parentheses in column 1.

or fainter than $Y_{AB} = 28.5$ and hence do not appear in the list of Bunker et al. All the Oesch et al. galaxies appear in the list of McLure et al. except for UDFz-38537519 (03:32:38.53, $-27:47:51.9$, J2000) which is the faintest z' -drop in their sample ($Y_{AB} = 29.17$, $J_{AB} = 29.13$) and is also too faint for the Bunker et al. selection.

For the Y -band drop-outs, all five galaxies presented in Bouwens et al. (2009) also appear in Bunker et al. (2009) with the exception of UDFy-37796000, which is too faint for the Bunker et al. cut of $J_{AB} < 28.5$. Bunker et al. have three additional sources not appearing in Bouwens et al., one of which (YD4 in Table 2) is also in the McLure et al. (2009) catalogue, and two others (YD5 at 03:32:35.85 $-27:47:17.1$ & YD6 at 03:32:40.40 $-27:47:18.8$) absent from the other catalogues.

There is one source in McLure et al. (2009), object 1422, which lies within $0''.4$ of object zD4/UDFz-39557176/1092, and presumably is classed as a single object in the other catalogues. There are 8 remaining sources in McLure et al. which do not appear in the other catalogues, either because of their faint magnitudes or their colours falling outside the selection windows for z' -drops and Y -drops. We note that McLure et al. adopt an SED-fitting approach, and the other groups utilize colour cuts.

References

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Bunker ID	Oesch/Bouwens ID	McLure ID	RA(J2000)	Dec(J2000)	z_{phot} (McLure)
—	—	2195	03 32 43.05	−27 47 08.1	6.45
—	UDFz-37446513	1880	03 32 37.44	−27 46 51.3	6.50
zD6	UDFz-36387163	1958	03 32 36.38	−27 47 16.2	6.50
zD8	UDFz-40566437	2206	03 32 40.58	−27 46 43.6	6.50
—	—	1064	03 32 34.93	−27 47 01.3	6.65
zD1	UDFz-42566566	688	03 32 42.56	−27 46 56.6	6.70
—	—	2794	03 32 36.75	−27 46 48.2	6.75
zD3	UDFz-42577314	1144	03 32 42.56	−27 47 31.5	6.80
—	—	2395	03 32 44.31	−27 46 45.2	6.80
zD4	UDFz-39557176	1092	03 32 39.55	−27 47 17.5	6.85
—	UDFz-37807405	2560	03 32 37.80	−27 47 40.4	6.90
—	—	2826	03 32 37.06	−27 48 15.2	6.90
zD5	UDFz-43146285	1678	03 32 43.14	−27 46 28.6	7.05
zD10	UDFz-39736214	2502	03 32 39.73	−27 46 21.4	7.10
zD9	UDFz-37228061	1574	03 32 37.21	−27 48 06.1	7.20
zD2	UDFz-38807073	835	03 32 38.81	−27 47 07.2	7.20
—	UDFz-41057156	2066	03 32 41.05	−27 47 15.6	7.20
—	—	2888	03 32 44.75	−27 46 45.1	7.35
—	—	2940	03 32 36.52	−27 46 41.9	7.40
YD7	UDFy-37636015	2079	03 32 37.63	−27 46 01.5	7.50
zD7	UDFz-44716442	1107	03 32 44.71	−27 46 44.4	7.60
—	—	1422 [†]	03 32 39.52	−27 47 17.3	7.60
YD4	—	2487	03 32 33.13	−27 46 54.4	7.80
YD1	UDFy-42886345	1765	03 32 42.88	−27 46 34.6	7.95
—	UDFy-43086276	2841	03 32 43.09	−27 46 27.9	8.10
YD2	UDFy-37796000	1939	03 32 37.80	−27 46 00.1	8.35
YD3	UDFy-38135539	1721	03 32 38.14	−27 45 54.0	8.45

[†] this object is within 0".4 of zD4/UDFz-39557176/1092.

Table 2: The galaxies identified by McLure et al. (2009) which have photometric redshifts $z > 6.4$, with the corresponding ID numbers from Bunker et al. (2009, column 1), and Oesch et al. (2009, prefix UDFz-) or Bouwens et al. (2009, prefix UDFy-) in column 2.